Q&A Session for Hydro Seminar Series - Session 7

Thursday, March 17, 2016

Question to Howard Reeves: Integrating Hydrography and Fisheries data to assess ecological flows

Q: To what extent can you link high yield area delineation to groundwater conditions - how are linkages made?

A: For the AFINCH application (Luukkonen and others, 2015), the initial estimate of yield is made using regression. Explanatory variables in the regression included soil information (SSURGO) and surficial and bedrock geology assembled in the Gap Analysis Program. These explanatory variables help link potential groundwater conditions to the estimated yields.

> *Luukkonen, C.L., Holtschlag, D.J., Reeves, H.W., Hoard, C.J., and Fuller, L.M., 2015, Estimation of monthly water yields and flows for 1951–2012 for the United States portion of the Great Lakes Basin with AFINCH: U.S. Geological Survey Scientific Investigations Report 2014–5192, 83 p., http://dx.doi.org/10.3133/sir20145192.*

Q: Data are missing from Illinois. Can data be submitted to the project?

A: We are open to including more data as feasible into our analysis and would welcome other data sources. Please send me some information on the data that is available (hwreeves@usgs.gov), and I will forward the information to the research team.

Questions to Dan Issak: Building a National Stream Internet

Q: NHDplus I believe is 1:100k resolution. Has any work been done with the high res NHD (1:24k)?

A: The 1:24k network can be used with the SSN models (just like any digital stream network once it's been topologically adjusted), but it doesn't have a set of reach descriptors like elevation, slope, stream size, etc. linked to individual reaches the way the 1:100 NHDPlus dataset does. Because those reach descriptors are useful to use a predictor variables in models, it makes using the 1:100k for SSN analyses much easier at present. When the 1:24k NHDPlus project is completed in future years we will try to update the NSI layer accordingly.

Q: Can you say more about the difference between the NSI network and the NHDPlus dendritic network?

A: The details about those differences are all described in the NSI user's guide on the project website here: http://www.fs.fed.us/rm/boise/AWAE/projects/NationalStreamInternet.html

---

Q: Re Building Nation Stream Internet - how does model handle large differences in data coverage, where there is a great deal of data over a given area versus another area that has scant data.

A: One of the nice things about the SSN models is that they can be used to show spatial differences in the amount of prediction uncertainty once a model has been fit. When the models are fit to dense datasets and the prediction standard errors are mapped they will be small (i.e., precise predictions) near sites with data observations but large when far away from data. In both cases the model should yield unbiased predictions and parameter estimates but there will be less precision where the data are sparse.

Q: Did NSI consider using NHD's 'event' data model to store stream data? Why was it (not) used?

A: Dave Nagel (dnagel@fs.fed.us) would be the person to ask this question of but it might also be addressed in the NSI user's guide on the project website here: http://www.fs.fed.us/rm/boise/AWAE/projects/NationalStreamInternet.html

---

Q: Have you considered expanding your research to include Bioacoustic monitoring with automated species identification? Do you have any of those type of monitors included in your network? Do you have access to or interest in bioacoustic monitoring as an indicator of ecosystem health?

A: The SSN models are best used with spatial datasets wherein there are >100 unique observation locations. If there are that many locations with bioacoustics measurements then the models might be usefully applied to those datasets. We haven't explored their use because most of the work we do focuses on climate change and species distribution modeling in small streams and medium sized rivers.

Q: What was the temporal resolution of your temperature data that was predicting stream temperatures to 0.6 degrees C? Was that daily values or annual averages or what?

A: The temperature model used for NorWeST predicts mean August stream temperatures based on an inter-annual resolution because we are interested in understanding climate change effects and don't want intra-annual resolution to avoid confounding by changing solar angles. But there's no reason one couldn't run the SSN model for temperature data at shorter temporal resolutions like hourly, daily, weekly, etc. It just depends on what the model is being optimized to do.

General questions:

Q: How could a state incorporate streamlines that they have edited to reflect present day (includes edits to areas of strip mines, levees, and river meander changes) than 24k topo maps?

A: Minor NHD edits can be submitted to this web page - http://usgs-mrs.cr.usgs.gov/usgssteward/maintenance.html. More extensive edits should be discussed with the NHD steward in your state. Steward contacts are here - http://nhd.usgs.gov/stewardship/#.Vur7hPkrLmF